Facility Design Issues

- Safety and environmental protection
- Waste flow
- Practical needs
- Future changes and growth!
- Note: Efficiencies gained w/ good design, smooth materials flow, comfortable staff.

Safety: Class H Building Code

- H occupancy (high-hazard) when storing flammables (>2 drums) or bulking flammable liquids into drums.
- Commonly Requires:
  - Explosion proof lighting and wiring,
  - Automatic Fire Suppression Systems,
  - Secondary containment and drainage,
  - Compatible materials in storage and drainage/containment,
  - Mechanical ventilation, backup power supply

H Occupancy Safety: Options to save $$$

- Intrinsically safe equipment, air powered
- Spot ventilation to minimize fan and motor size
- Skylighting and clearstories
- Use “listed” hazardous materials cabinets
- Try to separate Class H areas
  - Remove flammables to separate storage area
  - Build special flammables bulking room

Safety: Basic Requirements

- Reduce ergonomic and chemical exposure hazards by use of administrative and engineering contols before PPE (OSHA)
- Safety Shower and Eye Wash
  - plumbed or self-contained, 20 minutes flow (OSHA)
- Fire suppression
  - Extinguishers and automatic sprinklers
  - Dry chemical systems used in pre-fabs, or limited water
- Exits: 2-3 preferred, not blocked, no flammables near
- Communications (alarms, phone)

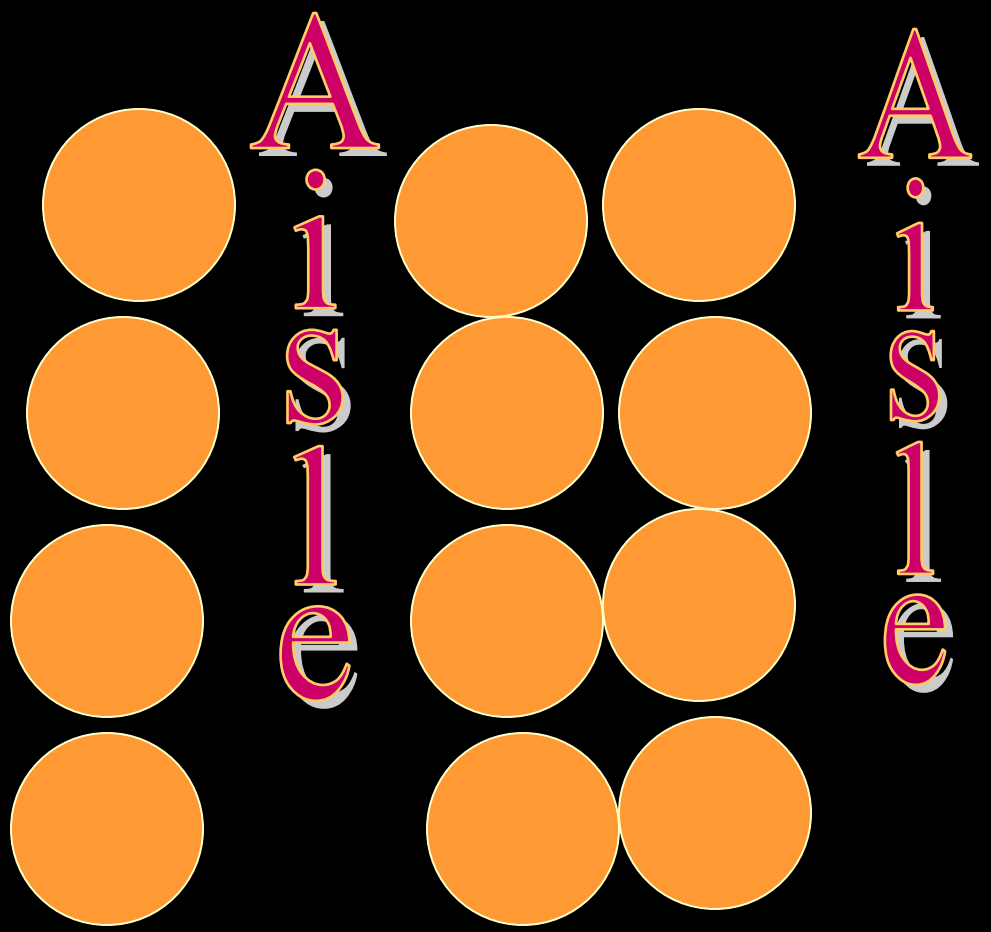
Safety and Environmental: Facility Considerations

- Spill or Leak Containment options (berms, ramps)
  - area, volume, and number of containment areas
  - means of separation, catch basins
- Impervious surface (paint, concrete, asphalt)
- Ventilation (flamm. vapors, toxics, dust)
  - Install ventilation at high and low points
  - Also at drum tops to remove fumes from face
  - General ventilation of >=6 air changes/hour

Waste Flow: Primary Space Needs

- Protected unloading area – carport, drive-thru
- Sorting Space – tables, drums, carts, workers
- Bulking space
  - Flammables (2-4 separate drums)
  - Latex Paint (drums: white, light, other OK, bad)
- Packing space (6-8 drums, 2-5 CY boxes)
- Supplies (PPE, absorbent, labels, references)
  - Closet or cabinet, open shelves less desirable
- Storage for full drums

Waste Flow: Drum Storage Requirements



- Each Drum uses about 2’ x 2’ floor area
- Aisle space practically 30”
- Need to have clear view of one side of each drum, allows for inspection and easy access.

Waste Flow: Areas Inside or Nearby Facility

- Flammable Drum Bulking & Storage Options
  - Pre-fabricated unit, 8’ x 20’, 3-bays
  - Metal sided, or Brick or cinder block building
  - Dedicated separate room(s)
- Supplies, Empty Drum Storage Options
  - Outside, in fenced area, or under shed roof
  - Space for boxes, tools, dolly, carts, spare pallets
- Reuse Area Options
  - Table, cabinet, room w/ shelves, separate shed

Waste Flow: Reuse Area Requirements

- Easy access for public
- Separation from HW processing/work area
- Parking nearby but away from queue
- Shelves for display - lots!
- Display and signs to imitate retail store
- Counter for signing waivers, log, and scale?
- Visibility from processing area (window?)

Practical Needs for Facility

- Convenient access to SW dumpster
- Compactor for corrugated cardboard?
- Electricity and/or air compressor for power
- Good natural and electric Lighting
- Water supply, if need restrooms or wet lab
- Grounded electric outlets, also for bonding/static discharge control for bulking flammable liquids
- Non-skid flooring

Practical Needs for Staff: Ventilation Options

- Fume hood (some are large enough to stand in, holds 3 drums)
- Drum top ventilation “collars” or wall mounted slotted grates
- “Elephant-truck” ventilation, suspended arm that moves around
- Waste oil heater/ AC

Practical Needs: Other Space Needed Somewhere

- Office space – desk, references, computer
  - Desk inside, separate room, office trailers
- Restroom, lockers
  - Changing area
  - ADA requires wide doors, special fixtures, 5-foot clear turning radius in restrooms, access, etc.
- Meeting room optional but nice!
  - Good for tours, 15’x 30’ minimum

Future Flexibility: Possible Additional Space Needs

- Can Crusher
- Aerosol processing
- Storage of Universal and other Wastes –
  - NiCad Batteries
  - Fluorescent lights and other MCD
  - CRTs and electronics
  - Propane Tanks
- Growth – more waste, staff, hours

Siting Considerations

- Access for:
  - Participants, transport vehicles, emergency vehicles
- Sufficient space, don’t fence yourself in!
- Utilities (water, electricity, fire suppression)
- Adjacent land uses, groundwater protection
- Security
- Minimizing Abandoned Waste

Common Site Layout Problems

- Siting on top of a landfill
- Siting in a floodplain
- No space for expansion
- Inadequate parking near reuse area
- Inadequate queuing space
- Too close to the road
- A truck loading dock would be nice!